

RTF Files and Attributed Strings

Rich Text Format (RTF) is a text formatting language devised by Microsoft Corporation. You can represent character, paragraph, and document format attributes using plain text with interspersed RTF commands, groups, and escape sequences. RTF is widely used as a document interchange format to transfer documents with their formatting information across applications and computing platforms. Apple has extended RTF with custom commands, which are described in this chapter.

Reading and Writing RTF Data

The Application Kit's extensions for `NSAttributedString` add support for reading and writing a number of popular document formats, including RTF and RTFD, as described in “Formatted Documents and Attributed Strings.” Although `NSAttributedString` has convenience methods for reading and writing RTF and RTFD data in particular, those methods have no advantage over the general-purpose methods, and they lack the useful `error:` parameter.

Apple's RTF Extensions

Apple has extended the RTF language to support text attributes and formatting constructs available in the Cocoa text system but not representable with standard RTF. The Apple extensions take the same form as standard RTF commands, groups, and escapes. RTF commands consist of a backslash followed by a string of alphabetic characters (case sensitive) followed by an optional integer parameter value which can be positive or negative. RTF groups begin with a left brace (`{`), followed by RTF sequences optionally including other groups, closed by a right brace (`}`). RTF escapes consist of a backslash followed by a special character, such as `\{`, which indicates a literal left brace instead of the beginning of a group.

RTF includes the concept of a *destination*, which is a group containing an RTF command and text possibly to be inserted at a different location in a document, such as a footnote. The escape sequence `*` indicates that RTF readers that don't understand the command that follows should ignore the contents of the destination.

Dimensions in RTF are expressed in *twips*—one twip is one twentieth of a point.

Table 1 lists Apple's RTF extensions for character attributes.

Table 1 Character attribute RTF extensions

RTF Sequence	Description	Parameter(s)
<code>\CocoaLigature<i>N</i></code>	Ligature control	Value of <code>NSLigatureAttributeName</code> 0 = no ligatures, 1 = default ligatures, 2 = all ligatures. Default value 1.
<code>\expansion<i>N</i></code>	Expansion factor to be applied to glyphs	2000 * value of <code>NSExpansionAttributeName</code> (log of expansion factor). Default value 0.
<code>\obliqueness<i>N</i></code>	Skew to be applied to glyphs	2000 * value of <code>NSObliquenessAttributeName</code> 0 = no skew. Default value 0.
<code>\fsmilli<i>N</i></code>	A finer specification for font size	1000 * font size. Written in addition to <code>\fs</code> when <code>\fs</code> is not an integral or half-point value; value is overridden by <code>\fs</code> , so this should be written immediately after <code>\fs</code> . Default driven by <code>\fs</code> .
<code>\shadx<i>N</i> \shady<i>N</i></code>	Shadow offset, written in conjunction with <code>\shad</code>	X and Y offsets in twips (0 = no offset). Defaults are <code>\shadx3</code> and <code>\shady-3</code> .
<code>\shadr<i>N</i></code>	Shadow blur, written in conjunction with <code>\shad</code>	Blur radius in twips. 0 = no blur. Default value 0.
<code>\strikec<i>N</i></code>	Strikethrough color	Color number. Default same as foreground text color.
<code>\strikestyle<i>N</i></code>	Strikethrough style, written where <code>\strike</code> , <code>\striked</code> , <code>\strikew</code> are not sufficient	Style and pattern mask, value of <code>NSObliquenessAttributeName</code> 0 = none; 0x8000 = by word; styles: 1 = single, 2 = thick, 9 = double; patterns: 0x100 = dotted, 0x200 = dash, 0x300 = dash dot, 0x400 = dash dot dot. Default value 0.
<code>\strokec<i>N</i></code>	Stroke color	Color number. Default same as foreground text color.

<code>\strokewidthN</code>	Glyph stroke width, written in conjunction with <code>\outl</code> .	20 * stroke width as percentage of font point size. 0 = no stroke. Default value 0. Negative values indicate that glyphs are both stroked and filled; the stroke width is taken from the absolute value of the parameter.
<code>\ulstyleN</code>	Underline style, written where the standard <code>\ul</code> commands are not sufficient	Style and pattern mask, value of <code>NSUnderlineStyleAttributeName</code> 0 = none; 0x8000 = by word; styles: 1 = single, 2 = thick, 9 = double; patterns: 0x100 = dotted, 0x200 = dash, 0x300 = dash dot, 0x400 = dash dot dot. Default value 0.
<code>{{\NeXTGraphic attachment \widthN \heightN} string}</code>	Name of attachment file in the same folder as the RTF file (typically packaged within an RTFD document)	The <i>attachment</i> is the attachment file name, encoded in UTF-8 and properly RTF-escaped. The width and height parameters optionally specify the attachment size in twips. The <i>string</i> is always 0xAC.
<code>{{X*\glidN basestring} string}</code>	Glyph ID for explicitly specified glyphs. (The extra <code>{}</code> pair is necessary to work around an RTF reader bug in OS X version 10.2 and earlier.)	Glyph identifier (parameter to <code>\glid</code>). The <i>basestring</i> is the string the glyph id is intended to override; this attribute is then applied to the specified <i>string</i> . Typically <i>string</i> and <i>basestring</i> are the same, although <i>string</i> might contain multiple instances of <i>basestring</i> .
<code>{{X*\glidN basestring \glcolN} string}</code>	Glyph ID for explicitly specified glyphs	Character identifier (parameter to <code>\glid</code>) and character collection (parameter to <code>\glcol</code>). Collection IDs: 0 = identity, 1 = Adobe-CNS1, 2 = Adobe-GB1, 3 = Adobe-Japan1, 4 = Adobe-Japan2, 5 = Adobe-Korea.
<code>{{X*\glid basestring \glnam glyphname} string}</code>	Glyph ID for explicitly specified glyphs	The <i>glyphname</i> is the glyph name in UTF-8 encoding.
<code>\AppleTypeServicesUN</code>	Character shape control	Value of <code>NSCharacterShapeAttributeName</code> The value is interpreted as Apple Type Services <code>kCharacterShapeType</code> selector + 1. The value 0 disables this attribute. Default value 0.

Table 2 lists Apple's RTF extensions for paragraph attributes.

Table 2 Paragraph attribute RTF extensions

RTF Sequence	Description	Parameter (s)
<code>\pardefstabN</code>	Default tab interval for paragraph	Tab interval value in twips. 0 = no tabs other than those explicitly specified. Default value 0.
<code>\qnatural</code>	Natural text alignment for paragraph (based on script), written along with <code>\ql</code>	None
<code>\slleadingN</code>	Paragraph line spacing (<code>NSParagraphStyle lineSpacing</code> method)	Line spacing value in twips. Default value 0.
<code>\slmaximumN</code>	Maximum line height (<code>NSParagraphStyle maximumLineHeight</code> method), written along with <code>\sl</code> and if needed <code>\slmult</code>	Maximum line height value in twips. Default value 0, implying no maximum.
<code>\slminimumN</code>	Minimum line height (<code>NSParagraphStyle minimumLineHeight</code> method), written along with <code>\sl</code> and if needed <code>\slmult</code>	Minimum line height value in twips. Default value 0.

Table 3 lists Apple's RTF extensions for document attributes.

Table 3 Document attribute RTF extensions

RTF Sequence	Description	Parameter (s)
<code>\readonlydocN</code>	Read-only document. This has nothing to do with the file system permissions or ownership of the file; it's just a hint that indicates that the document should be presented in a read-only fashion to the user, if the viewer or editor is capable.	0 = Not read-only, 1 = read-only. Default value 0.
	Cocoa RTF-writer version number. This is a number used by Apple to indicate the version	Incrementing version number. 0 = Not Cocoa writer, 1 = NextStep, 40 = OpenStep, 100 = OS X v10.0, 102 = 10.2. (Other than incrementing the number for future versions, no

	document.	area to recognize pre-Open documents as well.
\viewh <i>N</i> \vieww <i>N</i>	Size of display area (not window or view size) to be used for displaying the document	Display area dimension in twips. Default value unspecified.